EMI TEST REPORT

Test report No.: **EMC-FCC-0160**

Type of equipment: **DIGITAL AUDIO PLAYER**

Model Name: **CYPOSE I**

FCC ID.: **R92CYPOSEI**

Applicant: **Dimotech Co.,Ltd.**

Test standards: **FCC part 15 subpart B, Class B**

Test Procedure and Items :
AC Power Line Conducted Emissions Measurement: ANSI C63.4:2001
Radiated Emissions Measurement : ANSI C63.4:2001

Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: 2004. 06. 09-10 **Issued date: 2004 . 06. 16**

Tested by : J. S. Kim **Approved by:** M. S. Chung

KIM, JUNG-SOO **CHUNG, MIN-SEOK**

EMC Compliance Ltd.
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1. Client information

Applicant: **Dimotech Co.,Ltd.**
Address: 4F, 361-2 Yatap-dong, Bundang-gu, Seongnam city, Gyunggi-do, Korea
Telephone number: + 82-31-781-6206
Facsimile number: + 82-31-781-6209
Contact Person: Choi Bum Kyoo

Factory: Eiger Net, Inc
Address: Sincere Bldg, 2F, 332-34, Kocheon-dong, Euiwang city, Kyunggi-Do, Korea
Telephone number: + 82-31-458-6100
Facsimile number: + 82-31-458-7054

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2. Laboratory information

Address

EMC compliance Ltd.

82-1, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

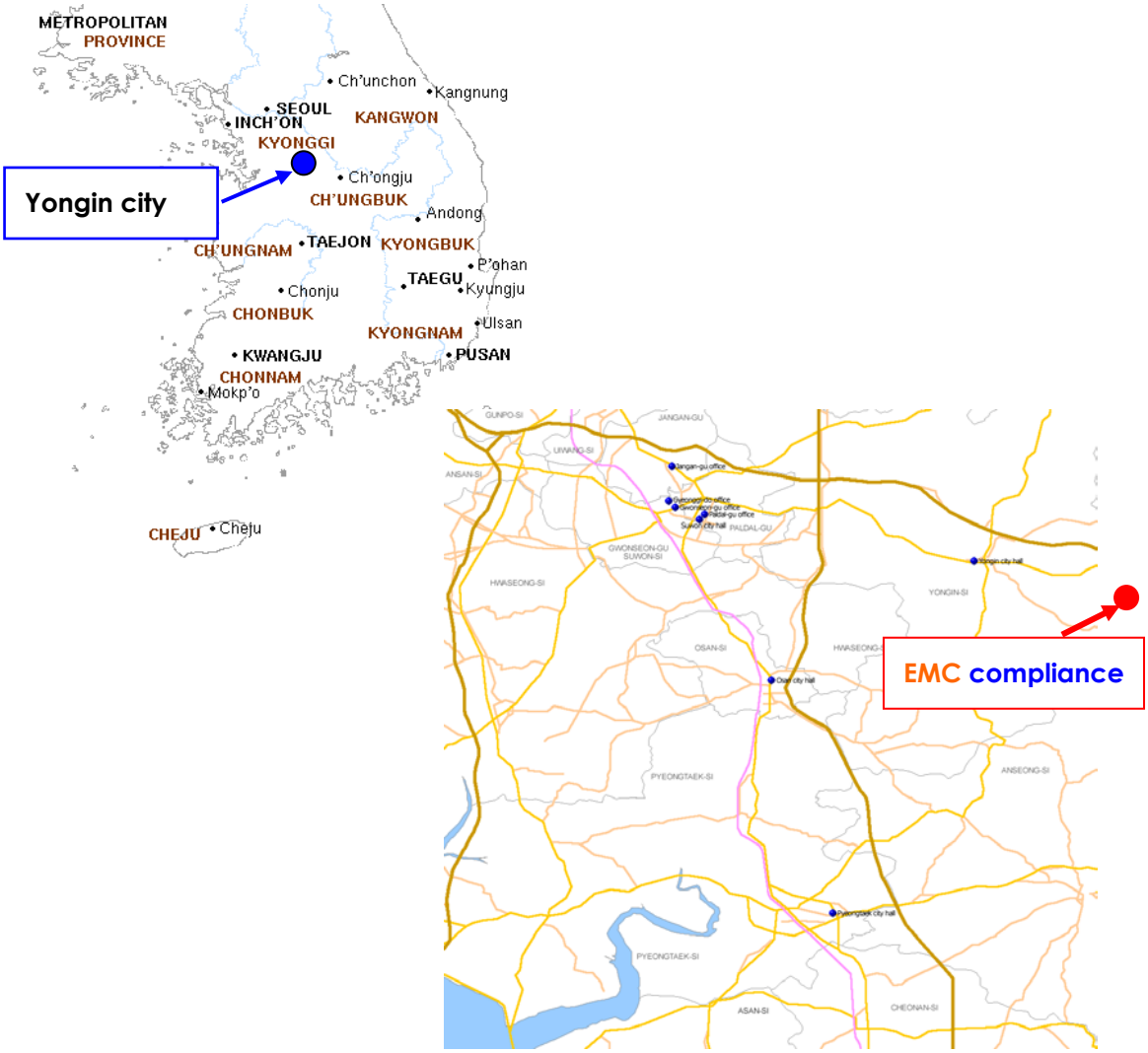
Telephone Number : 82 31 336 9919

Facsimile Number : 82 31 336 4767

FCC Filing No. : 793334

VCCI Registration No. : C-1713, R-1606

SITE MAP



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3. Test system configuration

3.1 Operation Environment

		Temperature	Humidity	Pressure
OATS	:	28 °C	54 %	1009 hPa
Shielded room	:	25 °C	50 %	1010 hPa

Test site

These testing were performed following locations;

Shielded room: Conducted emission
OATS (10m) : Radiated emission
OATS (3m) : FM TUNER

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are test receiver, Cable Loss, antenna factor calibration, Antenna directivity, antenna factor Variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, Site imperfection, mismatching, and system repeatability.

Based on NIS 80, 81, the measurement uncertainty level with a 95% confidence level was applied.

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3.3 Sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.
The sample calculation is as follows :

FS = MR + LF + CL MR = Meter Reading
LF = LISN Factor
CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB
The result (MR) is
30 + 1 + 1 = 32dBuV

Radiated emission

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.
The sample calculation is as follows :

FS = MR + AF + CL + AT -AG
MR = Meter Reading
AF = Antenna Factor
CL = Cable Loss
AP = Antenna Pad
AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB
The result (MR) is
30 + 12 + 5 + 10 –35 = 22dBuV/m

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4. Description of EUT

4.1 Product Description

Applicant:	Dimotech Co.,Ltd.
Factory:	Eiger Net, Inc
Type of equipment :	DIGITAL AUDIO PLAYER
Basic Model :	CYPOSE I
Serial number :	N/A
Power Rating:	DC 1.5V (AAA alkaline 1EA)

4.2 Peripherals

Description	Model / Part #	Serial number	Manufacture
PC	DIMESION4600	Y-0452RV-M0145-364-52	DELL
Monitor	PN17LT	P225HVDT301058	SEC
Printer	EPSON STYLUS C60	DR5K014977	EPSON
Keyboard	SK-8110	Y-01N729-38843-33S-00	DELL
PS/2 Mouse	M-S69	F466B0MN3NG1CI2	COMPAQ
Serial Mouse	SWW-23	N/A	A4Tech
Headset	Stereo LS1 Headset	N/A	Microsoft

4.3 Operating conditions

- MP3 play mode.
- FM tuner mode.
- Up & down load through the USB cable.
- Recording through the Line cable.

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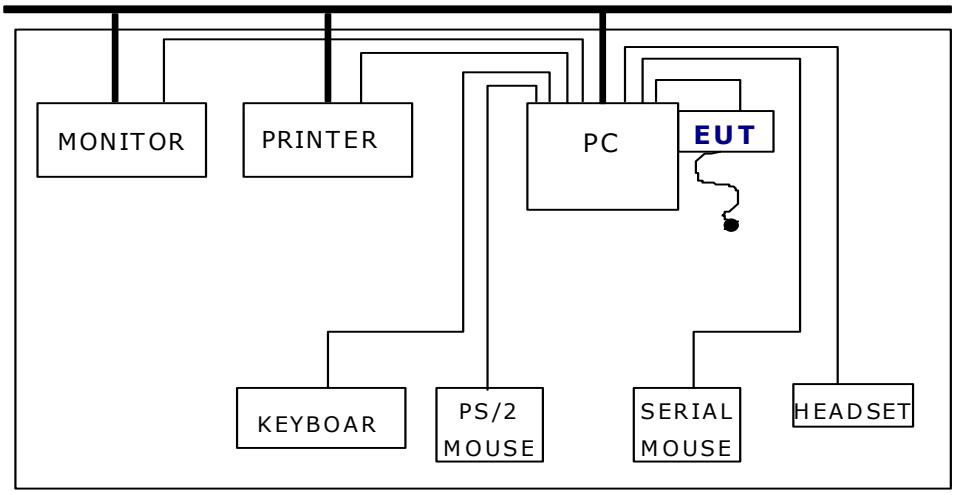
4.4 Used cables

Start		END		Cable Spec.	
Name	**I/O Port**	**Name**	**I/O Port**	**Length**	**Shield**
PC	VGA	MONITOR	D-SUB	1.5	Shield
	PARALLEL	PRINTER	PARALLEL	2.0	Shield
	PS/2	KEYBOARD	PS/2	1.8	Shield
	PS/2	PS/2 MOUSE	PS/2	1.8	Shield
	SERIAL	SERIAL MOUSE	SERIAL	1.8	Shield
	SPEAKER,MIC	HEADSET	P-JACK	2.0	Non-shield
EUT	USB	PC	USB	-	-
	LINE IN	PC	LINE IN	1.1	Non-shield
	Earphone	EAR	-	2.0	Non-shield

4.5 EUT test configuration



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5. Summary of test results

5.1 Modification to the E.U.T.

- None

5.2 Standards & results

FCC Part 15 Subpart B (Class B)
ANSI C63.4 – 2001

Test items	Test methods	Result
Conducted emission	ANSI C63.4-2001	Pass
Radiated emission	ANSI C63.4-2001	Pass
FM Tuner	ANSI C63.4-2001	Pass

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6. Test results

6.1 Conducted emission

6.1.1 Measurement procedure

Mains

The measurements were performed in a shielded room.
EUT was placed on a non-metallic table height of 0.1m above the reference ground plane.
The rear of tabletop was located 0.4m to the vertical conducted plane.
All other surfaces of tabletop were at least 0.8m away from any other grounded conducting surface.
Cables were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Each EUT power lead, except ground (safety) lead, was individually connected through a LISN to input power source.
Both lines of power cord, hot and neutral were measured.

6.1.2 Used equipments

Equipment	Model	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESHS10	843276/003	R&S	05.05.13	☒
L.I.S.N.	ESH3-Z5	100267	R&S	05.06.14	☒
	L3-32A	0120J20305	PMM	05.04.03	☒
Test site	Shield room	-	-	-	☒

6.1.3 Measurement uncertainty

Conducted emission measurement : (K=2)
9kHz-150 kHz : ±3.48
150kHz-300 MHz : ±3.05

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6.1.4 Test data

[Test mode : File Upload/download via USB]

Frequency	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.180	1.3	0.2	H	64.49	40.12	41.62	54.49	35.41	36.91
0.237	1.3	0.1	H	62.20	36.09	37.49	52.20	35.01	36.41
0.297	1.1	0.3	H	60.33	35.12	36.52	50.33	34.20	35.60
0.477	0.7	0.2	H	56.39	30.66	31.56	46.39	29.96	30.86
0.714	0.5	0.3	H	56.00	30.30	31.10	46.00	29.44	30.24
0.894	0.2	0.3	H		29.97	30.47		28.54	29.04
12.000	0.2	0.4	N	60.00	37.83	38.43	50.00	33.99	34.59
15.960	0.3	0.5	H		39.91	40.71		29.94	30.74
16.150	0.3	0.5	N		39.11	39.91		30.45	31.25
16.600	0.3	0.4	N		38.15	38.85		29.96	30.66
16.800	0.3	0.4	N		36.43	37.13		26.40	27.10

- Note. QP = Quasi-Peak, AV= Average
- LINE(N) : Neutral, LINE(H) : Hot
- Loss = LISN Loss + Cable Loss
- Measurement time : 1 s

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[Test mode : Recording via LINE in]

Frequency	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.180	1.3	0.2	H	64.49	41.31	42.81	54.49	36.45	37.95
0.297	1.1	0.3	H	60.33	36.35	37.75	50.33	34.59	35.99
0.477	0.7	0.2	H	56.39	32.33	33.23	46.39	30.32	31.22
0.537	0.7	0.3	H	56.00	31.72	32.72	46.00	27.66	28.66
0.894	0.2	0.3	H		31.18	31.68		28.80	29.30
0.951	0.2	0.3	H		32.15	32.65		28.97	29.47
1.548	0.1	0.4	H		31.57	32.07		27.53	28.03
1.665	0.1	0.4	N		31.33	31.83		27.86	28.36
2.499	0.1	0.4	N		31.57	32.07		28.21	28.71
15.830	0.3	0.5	N	60.00	38.42	39.22	50.00	29.56	30.36
16.410	0.3	0.5	N		38.52	39.32		30.79	31.59

- Note. QP = Quasi-Peak, AV= Average
- LINE(N) : Neutral, LINE(H) : Hot
- Loss = LISN Loss + Cable Loss
- Measurement time : 1 s

6.1.5. Result

Complied

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6.2 Radiated emission

6.2.1 Measurement procedure

A pretest was performed at 3m distance in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.1m above the reference ground plane.
Cables were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test receiver	ESVS10	827864/006	R&S	05.05.14	☒
TRILOG Broadband Antenna	VULB 9160	3138	SCHWARZBECK	05.04.10	☒
Antenna Mast	A109	N/A	DEAIL	-	☒
Turn Table	TS14	N/A	DEAIL	-	☒
10m OATS	-	-	EMC Compliance	-	☒

6.2.3 Measurement uncertainty

Radiated Emission measurement : (K=2)
30-300 MHz ; 3 m: ±3.56, 10 m: ±3.50
300-1000 MHz ; 3 m: ±4.47, 10 m: ±2.64

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6.2.4 Test data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
					Antenna	Cable			
UP/DOWN MODE									
48.85	2.4	V	1.0	212	12.17	1.70	30.0	16.27	13.73
60.24	7.2	H	4.0	320	11.28	1.80	30.0	20.28	9.72
72.90	13.2	V	3.2	0	9.07	2.00	30.0	24.27	5.73
84.96	14.7	V	1.0	339	7.61	2.10	30.0	24.41	5.59
144.35	3.4	H	4.0	261	13.23	2.70	30.0	19.33	10.67
192.84	13.8	H	4.0	354	10.26	2.90	30.0	26.96	3.04
336.40	14.0	V	1.0	201	13.68	4.50	37.0	32.18	4.82
384.52	3.5	V	1.2	320	14.86	4.70	37.0	23.06	13.94
433.12	12.4	H	3.9	184	16.50	5.00	37.0	33.90	3.10
484.02	2.1	V	1.5	285	17.06	5.50	37.0	24.66	12.34
527.66	8.2	V	1.1	281	18.11	5.80	37.0	32.11	4.89
576.17	1.2	V	1.0	234	19.45	6.20	37.0	26.85	10.15
LINE IN MODE									
81.25	17.0	V	1.1	132	7.61	2.10	30.0	26.71	3.29
196.98	13.5	H	4.0	255	9.81	3.10	30.0	26.41	3.59
205.15	10.6	H	4.0	320	9.57	3.20	30.0	23.37	6.63
PLAY MODE									
137.02	9.1	H	3.9	282	12.88	2.60	30.0	24.58	5.43
146.08	8.1	H	3.8	254	13.25	2.70	30.0	24.05	5.95

* Receiving Antenna Mode : *Horizontal, Vertical*

* 10 m OATS

* *Note : Reading = Test Receiver meter,*

P= Polarization → POL H = Horizontal, POL V = Vertical

* *Result = Field Strength (Antenna factor + Cable factor + Reading)*

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[Test mode : FM Tuner]

Tuner Freq. [MHz]	Local Oscillator	Frequency [MHz]	Reading [dBuV]	Pol.	Height [m]	Angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dBuV/m]
							Ant.	Cable			
87.5	Fundamental	98.20	-	-	-	-	-	-	-	-	-
	Harmonics	294.60	14.3	H	4.0	320	13.14	3.40	46.0	30.84	15.16
		392.80	18.4	H	4.0	254	15.10	4.00	46.0	37.50	8.50
98	Fundamental	108.70	-	-	-	-	-	-	-	-	-
	Harmonics	434.80	10.8	H	3.8	54	16.53	4.20	46.0	31.53	14.47
108	Fundamental	237.40	-	-	-	-	-	-	-	-	-
	Harmonics	356.10	11.9	H	4.0	298	13.99	3.80	46.0	29.69	16.31
		474.80	12.5	H	4.0	212	17.07	4.50	46.0	34.07	11.93
Other Freq.		125.18	9.2	H	3.9	189	11.62	2.00	43.5	22.82	20.69
		146.54	9.8	H	4.0	201	13.25	2.20	43.5	25.25	18.25

* Receiving Antenna Mode : *Horizontal, Vertical*

* 3 m OATS

* IF Bandwidth : 120kHz

* *Note : Reading = Test Receiver meter,*

P= Polarization → POL H = Horizontal, POL V = Vertical

* *Result = Field Strength (Antenna factor + Cable factor + Reading)*

6.2.5. Result

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7. Appendix - Test Graphs

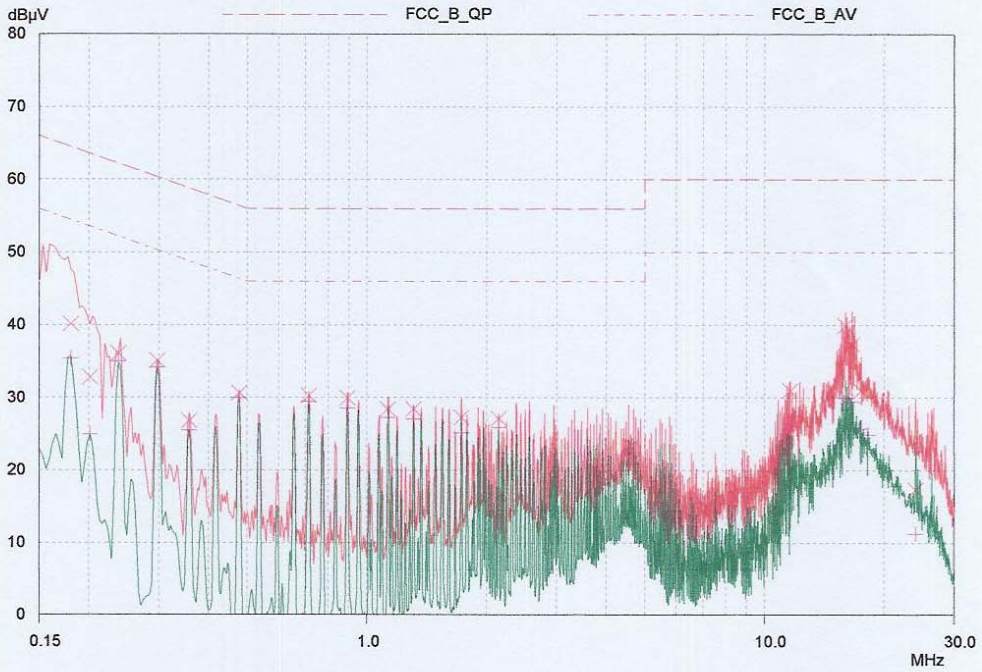
Conducted Emission test graph
[USB MODE]

EMC Compliance LTD 09 Jun 2004 16:40

EUT:	CYPOSE
Manuf:	DIMOTECH
Op Cond:	H
Operator:	
Test Spec:	FCC Class B Conducted Emission
Comment:	USB UP/DOWN
Result File:	0406020h.dat : CYPOSE MP3
Scan Settings	(2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB



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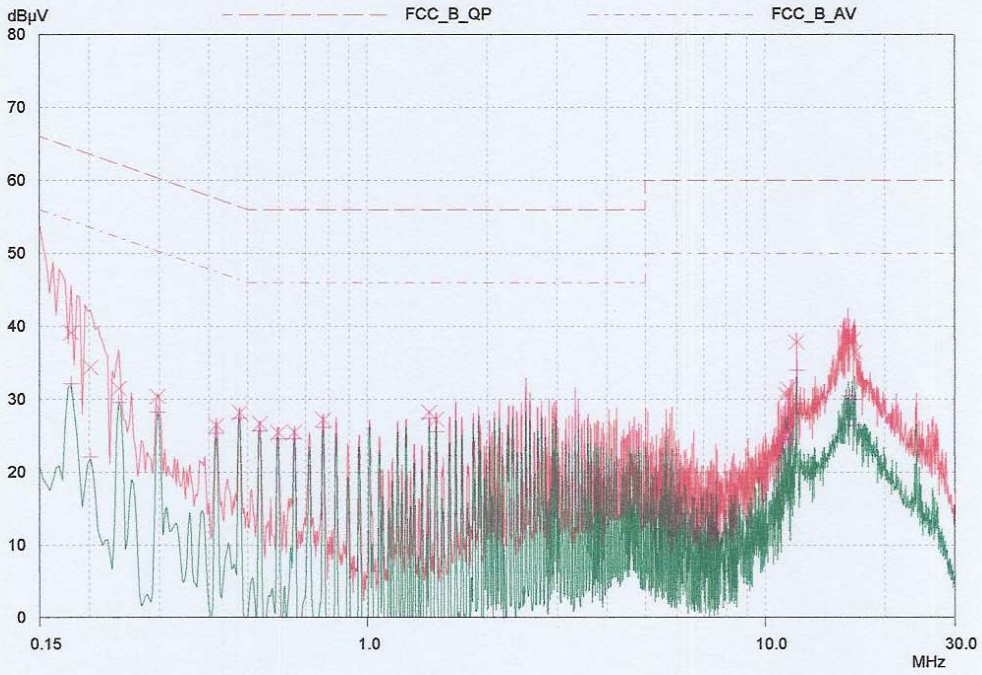
09 Jun 2004 16:56

EUT:	CYPOSE
Manuf:	DIMOTECH
Op Cond:	N
Operator:	
Test Spec:	FCC Class B Conducted Emission
Comment:	USB UP/DOWN
Result File:	0406020N.dat : CYPOSE MP3
Scan Settings	(2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB



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[LINE-IN MODE]

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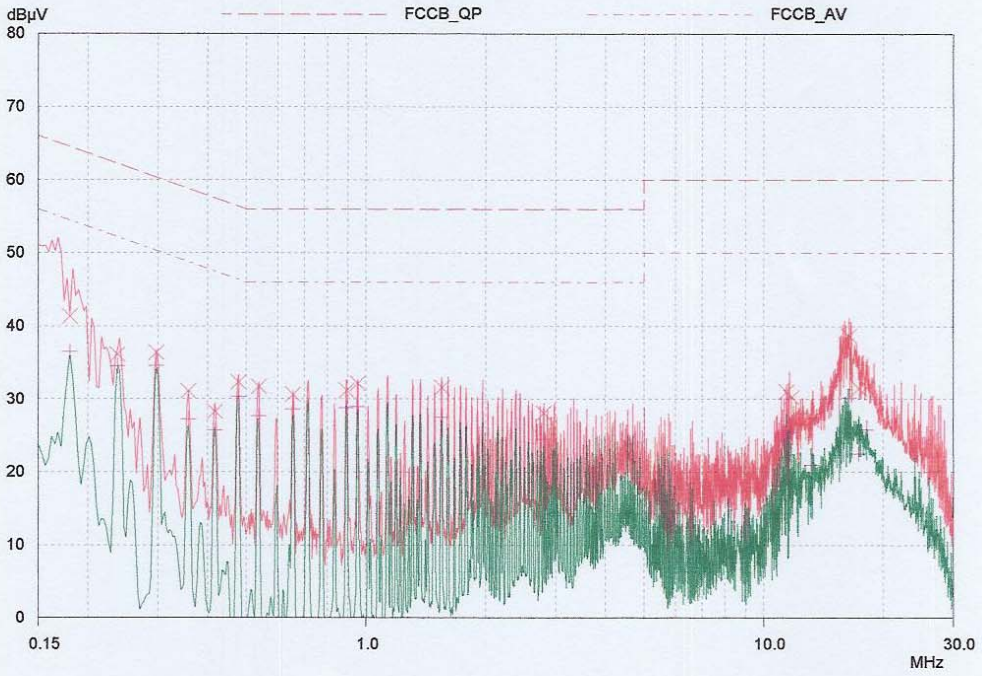
09 Jun 2004 17:32

EUT:	CYPOSE
Manuf:	DIMOTECH
Op Cond:	H
Operator:	
Test Spec:	FCC Class B Conducted Emission
Comment:	LINE RECORDING
Result File:	040602LH.dat : CYPOSE MP3
Scan Settings	(2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB



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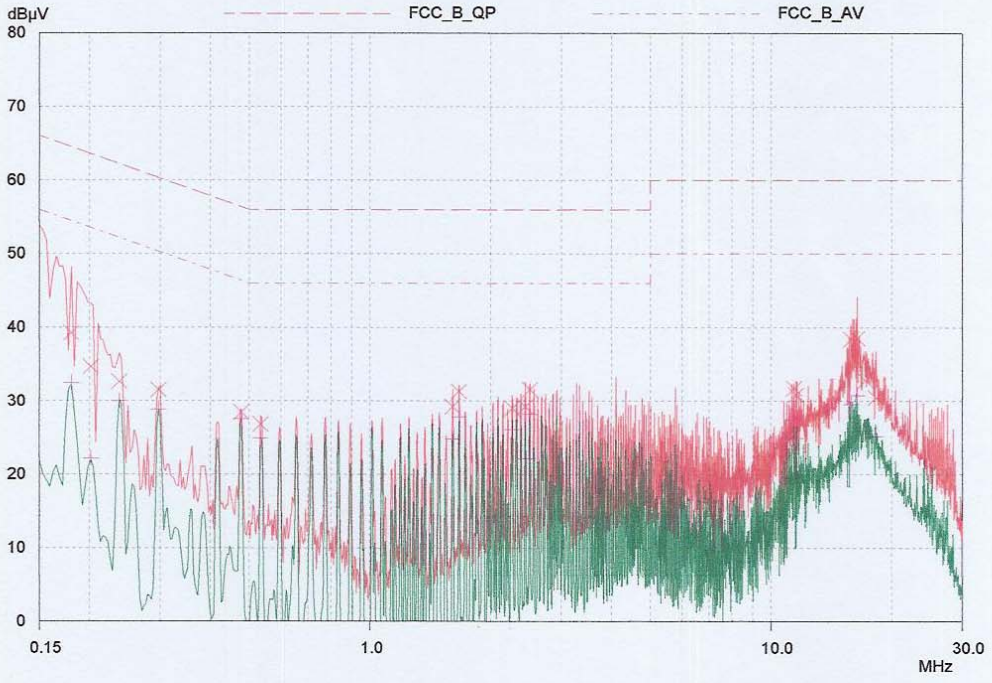
09 Jun 2004 17:19

EUT:	CYPOSE
Manuf:	DIMOTECH
Op Cond:	N
Operator:	
Test Spec:	FCC Class B Conducted Emission
Comment:	LINE RECORDING
Result File:	040602LN.dat : CYPOSE MP3
Scan Settings	(2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB



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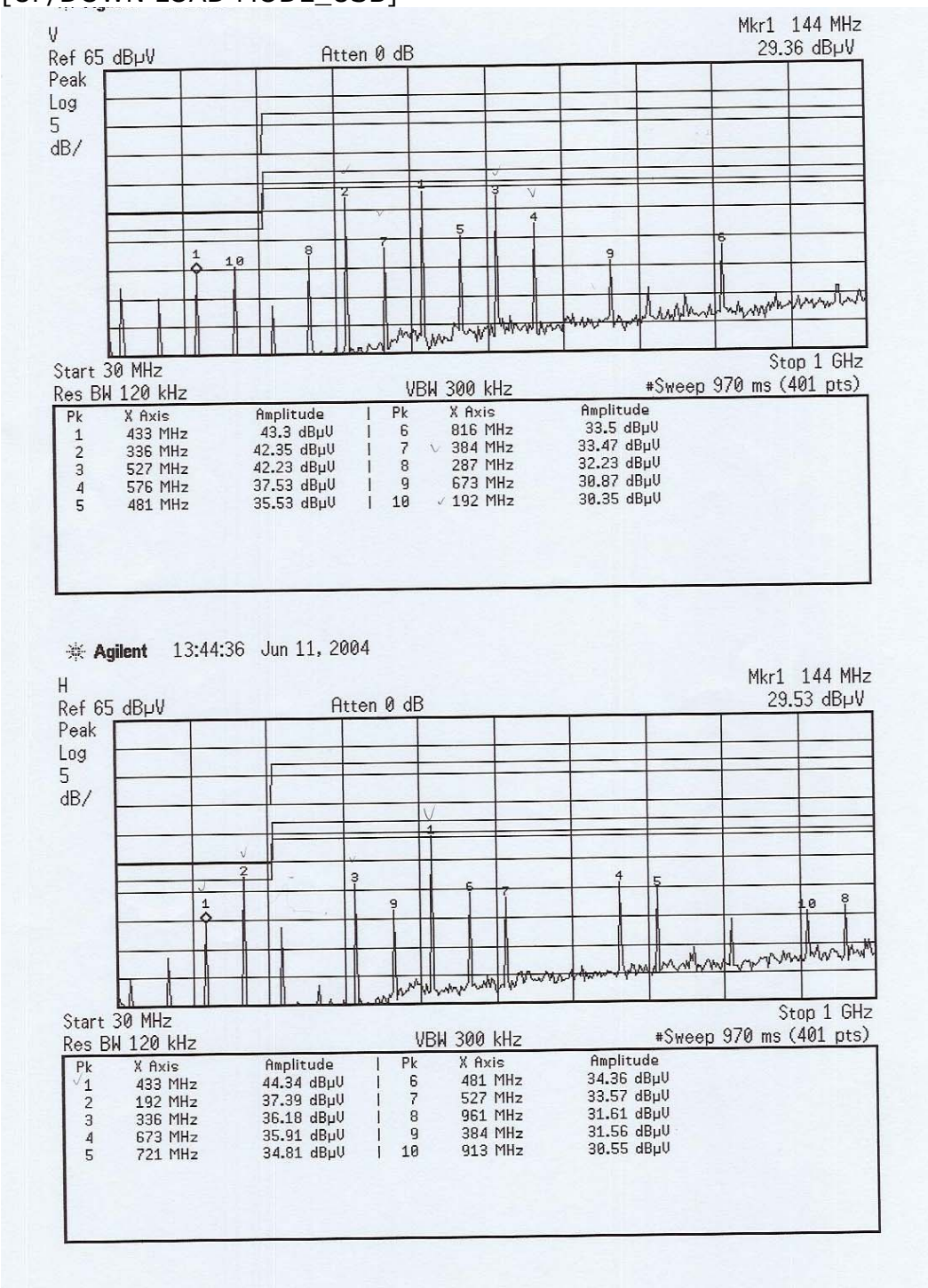
Radiated Emission test graph (3m chamber scan data)

[UP/DOWN LOAD MODE_USB]



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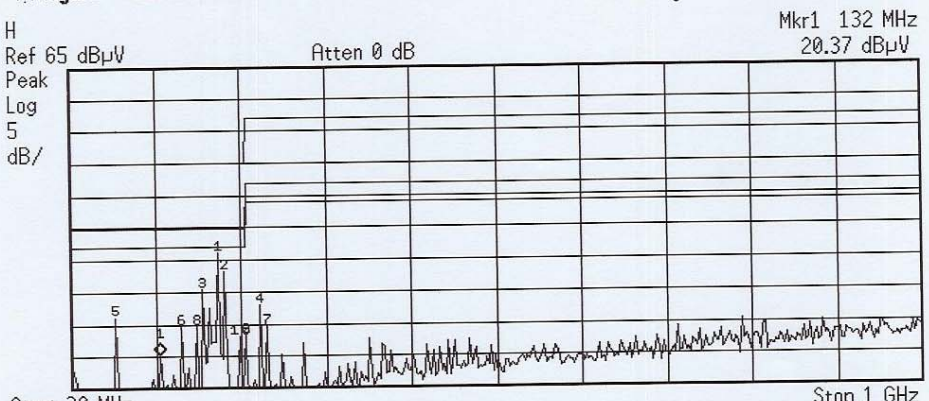
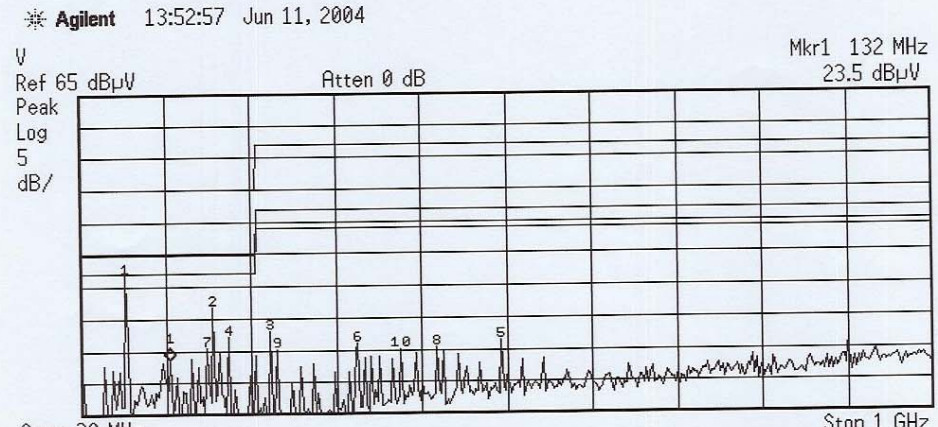
[RECORDING_LINE-IN]



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	197 MHz	36.07 dBµV	6	156 MHz	24.64 dBµV
2	205 MHz	33.26 dBµV	7	253 MHz	24.63 dBµV
3	180 MHz	30.32 dBµV	8	173 MHz	24.6 dBµV
4	246 MHz	27.99 dBµV	9	229 MHz	23.32 dBµV
5	81 MHz	26.12 dBµV	10	222 MHz	23.08 dBµV



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	81 MHz	36.86 dBµV	6	345 MHz	26.03 dBµV
2	180 MHz	31.68 dBµV	7	173 MHz	25.36 dBµV
3	246 MHz	28.07 dBµV	8	435 MHz	25.32 dBµV
4	197 MHz	27.1 dBµV	9	253 MHz	25.23 dBµV
5	508 MHz	26.38 dBµV	10	394 MHz	25.15 dBµV

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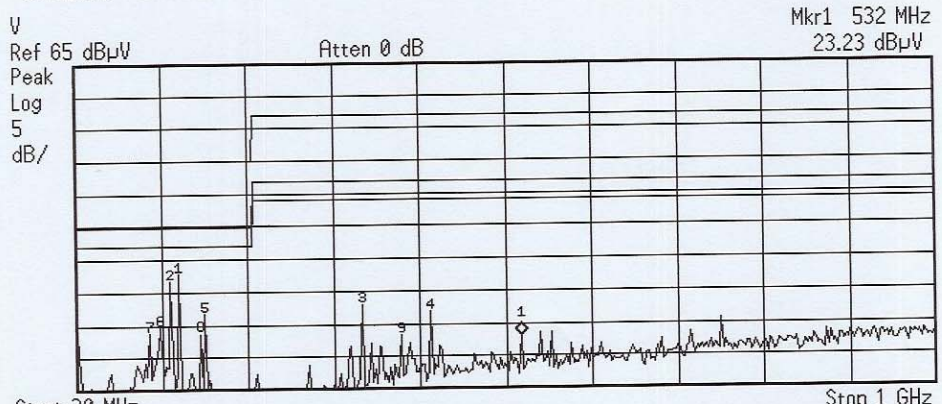
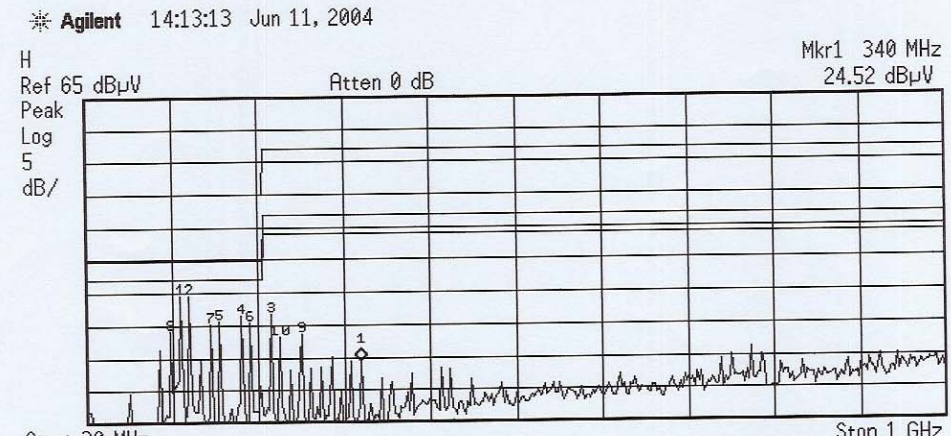
[MP3 Play mode]



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	146 MHz	32.93 dBµV	6	125 MHz	24.7 dBµV
2	137 MHz	31.75 dBµV	7	112 MHz	23.76 dBµV
3	353 MHz	27.93 dBµV	8	171 MHz	23.7 dBµV
4	430 MHz	26.83 dBµV	9	396 MHz	23.41 dBµV
5	176 MHz	26.74 dBµV	10		



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	137 MHz	34.69 dBµV	6	214 MHz	30.38 dBµV
2	146 MHz	34.55 dBµV	7	171 MHz	30.12 dBµV
3	239 MHz	31.83 dBµV	8	125 MHz	29.12 dBµV
4	205 MHz	31.5 dBµV	9	273 MHz	28.67 dBµV
5	180 MHz	30.6 dBµV	10	248 MHz	28.2 dBµV

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